

ABSTRACT

TITLE: Rhode Island Comprehensive Solid Waste Management Plan

SUBJECT: Management and disposal of solid waste

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ABSTRACT: This plan updates the Solid Waste Management Plan prepared in 1981. It is also intended to guide activities of the Department of Environmental Management (DEM) and to meet the need for a solid waste management plan as required by the Federal Resource Conservation and Recovery Act of 1976 (RCRA).

The plan describes existing practices, programs and activities in all major solid waste management areas and develops recommendations specific to each area.

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171-1 EXECUTIVE SUMMARY

1-1 PURPOSE

The purpose of the Rhode Island Comprehensive Solid Waste Management Plan (Plan) is to:

- Identify the needs caused by specific wastes and the need to develop waste-specific management programs, on a waste-by-waste basis;
- protect those natural resources affected by solid waste management activities;
- maximize the utilization of resources recovered from the solid waste stream; and
- in general to provide guidance for the environmentally sound management and disposal of solid waste in Rhode Island based on an integrated, statewide, comprehensive management plan.

The objectives of the Plan are to:

- develop policies, programs, and facilities in order to meet identified needs for the management of specific wastes that protect and preserve the environment and public resources and promote the convenience, health, comfort, safety and welfare of the people of the state; and
- make recommendations to improve the management of solid waste in Rhode Island;
- enable the development and adoption of strategies to reduce the generation of solid waste and to maximize the recycling of recovered resources;
- provide guidance to monitor the effectiveness of all management programs;
- guide the fee-setting process.

This plan is the guiding policy and program document of the Rhode Island Solid Waste Management Corporation (the Corporation) and the Department of Environmental Management (DEM). In addition, Appendix A to this Plan supersedes the Corporation's Statewide Resource Recovery System Development Plan (SDP), adopted in 1987. The SDP will be updated by the Corporation on an annual basis consistent with the format outlined in Appendix A. See Appendix A for the purposes of the SDP.

The Plan provides a description of existing practices, programs and activities in all major areas of solid waste management together with findings for each management area. From the findings for each management area are developed recommendations specific to each waste management area.

The Plan also provides in Chapter 5 carefully calculated projections of quantities of solid waste generated, disposed and recycled (on a commodity-by-commodity basis).

With the descriptions of the existing system taken with the management area-specific findings and recommendations and the waste and recycling quantity projections, the Plan will serve as guidance to solid waste management decision makers and as a blueprint toward development of a state-of-the-art integrated system of the future.

This Plan is also the solid waste management element of the State Guide Plan, developed in cooperation with the Statewide Planning Program (SPP). Staff from the Department of Administration's Division of Planning served on the Working Group created by the Corporation and the DEM to guide its development.

The State Guide Plan is the basic guide for long-term physical, economic, and social development of the State and serves as a means for centralizing and integrating long-range goals, policies, and plans. The plans and programs of a number of state and local agencies including the Coastal Resources Management Council and projects of the Rhode Island Port Authority and Economic Development Corporation are required to be consistent with the State Guide Plan. Federal grant applications, direct federal actions, and other state plans are reviewed for their consistency with the State Guide Plan through the Intergovernmental Review Process.

The Comprehensive Solid Waste Management Plan also updates the Solid Waste Management Plan prepared in 1981 by the Department of Environmental Management (DEM) in accordance with Section 4002(b) of the Federal Resource Conservation and Recovery Act of 1976 (RCRA). RCRA establishes programs for federal and state regulation of the management of solid and hazardous waste. This Plan is also intended to guide activities of DEM and to meet the need for a State solid waste management plan as required by the RCRA. DEM staff drafted certain sections of this Plan. In addition, DEM staff served on the Working Group created by the Corporation to guide the development of this Plan and played a major role in the development of the Plan.

1-2 Recent History of Solid Waste Management in Rhode Island

Since the last state Solid Waste Management Plan was prepared in 1981, there have been major changes in the State's approach to solid waste management. These include major programs for source reduction and recycling, and an intensified 15-year effort to reduce reliance on land disposal. The Corporation's efforts to develop a waste-to-energy system ended in 1992 when the General Assembly enacted a prohibition against the development of waste-to-energy plants by the Corporation.

This Comprehensive Plan, the Corporation's 1987 SDP and state legislation have established priorities for planning which place source reduction and recycling as the preferred options. A municipal recycling program was initiated in the Fall of 1987 in two communities: West Warwick and East Greenwich. Over 85 percent of Rhode Island's households, located in twenty-eight communities, participate in the state's recycling program. In addition to the mandatory programs, nine communities have started voluntary drop-off programs. By the end of 1995, the Corporation plans to have additional recyclables processing capacity available so that the remainder of the state's households will have recycling programs. In addition, the Corporation has completed a waste composition analysis that provides valuable data for the development and implementation of waste reduction and recycling programs.

Solid waste disposal in Rhode Island is now largely a function of state government:

- Approximately 96 percent of Rhode Island's municipal solid waste and an estimated 90 percent or more of the commercial solid waste streams were disposed at one facility in 1994: the State Landfill owned and operated by the Corporation in Johnston. The remaining commercial waste is being disposed of at facilities in Massachusetts; little or no solid waste from Rhode Island is disposed of in Connecticut because of the relatively higher tipping fees at available facilities there.

- Between 1989 and 1994, 50-70 percent of Rhode Island's commercial waste was disposed of in facilities in Maine, Massachusetts and New Hampshire, drawn by the low tipping fees which resulted from the surplus in disposal capacity caused by the economic recession and recycling. Beginning in mid-1994, the regional waste disposal markets tightened, driving out-of-state tip fees up while the State Landfill's tip fees remained stable. Consequently, most of the State's commercial waste once again went to the State Landfill for disposal.
- The only solid waste disposal facilities operating in Rhode Island other than the State Landfill in 1995 were the municipal landfills of Bristol, Charlestown and Tiverton, all of which are dedicated solely to their host communities' municipal waste and the construction/demolition debris landfill operated by Hometown Properties, Inc. on Dry Bridge Road in North Kingstown.
- The Corporation subsidizes the processing of municipal recyclables at its facilities. In 1995 the disposal of municipal solid waste at the Landfill was subsidized by the commercial waste tipping fee, a practice dating back to the acquisition of the Landfill by the Corporation in 1980.
- State legislation requires that the Corporation develop an integrated system of solid waste management facilities and programs sufficient to meet the waste disposal needs of Rhode Islanders.
- The Corporation is developing such a system based on the priorities of source reduction, source separation and recycling/composting, processing and land disposal within the framework established by state laws, regulations, and economic conditions. This system includes the Corporation and DEM Source Reduction Programs; the Statewide Municipal, Commercial and State Agency Recycling Programs; the Materials Recovery Facility and central leaf and yard debris composting facility at the Corporation's complex in Johnston; and the State Landfill Facilities.

1-3 ORGANIZATION OF THE PLAN

Part 171-1, the Executive Summary presents: 1) the purposes of the Comprehensive Plan; 2) a brief history of solid waste management in Rhode Island; 3) a brief organization of the Plan; 4) a discussion of municipal relations; and 5) a brief summary of the Plan's recommendations.

Part 171-2 presents the State's Goal, Objectives and Policies for solid waste management. These provide the basis for the Plan's recommendations and for guiding the actions of state, local and private programs.

THE GOAL FOR THE MANAGEMENT OF SOLID WASTE IN RHODE ISLAND:

Environmentally sound management of solid waste that protects and preserves the environment and public resources and promotes the convenience, health, comfort, safety and welfare of the people of the state at reasonable cost including, in order of preference, source reduction, source separation and recycling/composting and disposal.

Part 171-3 presents data about Rhode Island, its population, industry and economy, political subdivisions and other administrative units and transportation system.

Part 171-4 summarizes the institutional arrangements for solid waste management in Rhode Island. First, the current system arrangements and their evolution are described. Second, responsibilities of key agencies and sectors are outlined.

Part 171-5 presents projections for solid waste managed through the various components of the system, along with the assumptions used. The projections take into account a number of variables which can affect waste quantities, and are designed to determine a reasonable range of waste quantities to utilize for facility and program planning. This section and Appendix A supersedes the projections contained in the 1987 Statewide Resource Recovery System Development Plan (SDP).

Part 171-6 outlines the status of Rhode Island's mandated integrated system of solid waste facilities and programs based on priorities of source reduction, source separation and recycling, processing, and land disposal and the demands of the legislature, DEM, the courts, and economic conditions.

Part 171-7 discusses special wastes and sets out programs and strategies for management of certain components of the waste stream, including, tires, white and brown goods and scrap metal, demolition/construction waste, sludge, septage, agricultural waste, household and vehicle batteries, used oil collection and management, medical waste and household hazardous waste.

Part 171-8 presents general discussions of: 1) financing the cost impacts of Rhode Island's integrated solid waste management system; 2) the principal elements of cost, particularly landfilling and recycling costs; 3) financing the system; 4) the costs of several major facilities or programs under consideration by the Corporation or municipalities, and 5) financing municipal recycling via user fee systems.

1-4 ACKNOWLEDGEMENTS

The Plan was developed through a cooperative process involving the Solid Waste Management Corporation, the Department of Environmental Management and the Division of Planning, Department of Administration. The Board of Commissioners of the Solid Waste Management Corporation reviewed the Plan for conformance and consistency with the overall policies of the Corporation and has approved it. The Corporation's Commissioners are:

Dominic L. Ragosta, Chairman
A. Austin Ferland, Vice Chairman
Jerry Ligon, Treasurer
John St. Sauveur
Kenneth M. Bianchi, North Smithfield Town Administrator
Senator Roger Badeau
Leonard F. Clingham Jr., Esq.
Representative Robert Lowe
Representative Wayne Salisbury

The Corporation retained the consulting firm of Roy F. Weston, Inc. to assist in the preparation of the Plan. In addition, the Corporation and DEM staff also prepared sections of the Plan.

The Plan was originally prepared by the Corporation and DEM staffs with the assistance of Roy F. Weston, Inc., the technical consultant for the Plan.

Extensive and valuable assistance in the development of the Plan was provided by a Working Group from August 1991 to the Summer of 1992. When work on the Plan resumed, the Working Group resumed its meetings in January, 1995. Their commitment of time, energy and patience is deeply appreciated. The members of the Working Group and their alternates are:

Audubon Society of Rhode Island
Eugenia Marks

Brown University, Center for Environmental Studies
Harold Ward

Citizen's Advisory Board, RISWMC
Peggy Sharpe

Governor's Office
Kevin Brubaker
Sally Spadaro

R.I. War on Waste
Cyndi Roper

Amy Tavares

Solid Waste Management Association of Rhode Island
Thomas McCaughey
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Rhode Island Department of Administration
Daniel W. Varin
Frank Geremia, Alternate

Rhode Island Department of Environmental Management
Frederick J. Vincent
Victor Bell (resigned in January 1992)
Janet Keller
John Callan
Terri Bisson
Marty Davey
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Rhode Island League of Cities and Towns
Mayor Robert McKenna, Newport
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Rhode Island Public Expenditure Council
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University of Rhode Island, Department of Natural Resources Science
William R. Wright

1-5 RELATIONS WITH MUNICIPALITIES

In May 1995, the Corporation launched a new era in its relations with the State's cities and towns when, for the first time in its history, it offered a model contract to all municipalities. The model contract set terms and conditions under which the municipalities could dispose of their solid waste with -- and deliver their recyclables to -- the Corporation.

Moreover, the Corporation used the model contract as the mechanism by which it offered to municipalities, on a pro-rata basis, a share of the significant revenues that had developed during 1994-1995 from the sale of recyclables.

While this model municipal contract is for Fiscal Year 1996 only, the Corporation plans to offer five-to-ten-year contracts to municipalities beyond FY 1996 in order to bring long-term stability, predictability and standardization to all important business relationships between municipalities and the Corporation, particularly tipping fees and recyclables revenue sharing.

The initial response from municipalities was highly favorable.

In June 1995, Johnston's prolonged legal battle to close the State Landfill finally ended with a Rhode Island Supreme

Court decision supporting the Corporation. The town had argued that the 1988 Consent Agreement between the Town, the Corporation and DEM prevented further landfill expansion in Johnston and provided for the closure of the Central Landfill by July 1994.

In May 1994 the Superior Court ruled the Corporation could continue to utilize the Johnston facility under its DEM license and it defined the footprint of the Central Landfill as that 121 acre area on which there had been landfilling since 1980. The litigation ended when Rhode Island the Supreme Court rejected Johnston's appeal.

The Corporation will now work with the Town of Johnston to develop a host community benefit package which fairly and equitably compensates the Town for hosting the State's Landfill.

1-6 RECOMMENDATIONS FOR FUTURE SOLID WASTE MANAGEMENT

Given the constraints imposed on the Corporation, the uncertainty in the resolution of outstanding issues related to those constraints, and the rapidly evolving regulatory, technical and economic environment surrounding solid waste, it would be unrealistic and misleading to recommend a specific set of facilities that can be expected to meet the State's solid waste management needs. Such a recommendation would be obsolete very quickly, and necessitate re-examination of all of the decisions made each time there was a change in the solid waste management environment. However, decisions do have to be made, and the goals and objectives for future solid waste management preserved.

This Plan develops recommendations for the development and implementation of facilities or programs and provides decision-making process guidance for future decisions. The key factors to be analyzed in the decision-making for each facility are outlined. These recommendations serve as a much more useful guidance than a fixed set of facilities, which would have to be altered as conditions changed.

The full discussion of recommendations is contained in Part 171-8, but the key aspects can be summarized as follows:

- Expand recycling processing capacity through expansion of the existing MRF;
- Increase the number and type of materials that are extracted from the waste stream with a view toward maximizing recycling to the extent economically, technologically and environmentally feasible and practicable, as determined under existing statutes and regulations.
- Proceed as rapidly as possible with the licensure of the Southwest Landfill;
- Perform a cost-benefit analysis of constructing a facility at the State Landfill to remove recyclables from the commercial waste stream;
- analyze the economic impacts of and do a market analysis before proceeding with a construction and demolition debris processing facility;
- analyze the economic impacts, need, impacts on other programs, particularly recycling and reliability of technology before proceeding with a municipal solid waste composting facility;
- analyze the need for, location, system economic impacts, impacts on other programs, particularly recycling, and technology reliability before undertaking other management options or proceeding with new waste management facilities.

- Develop a stable, long-term funding mechanism for the Corporation so the Corporation and its customers can reliably project what the tipping fees will be over the mid term and so the Corporation can more accurately plan for and develop infrastructure.

- Support the expeditious establishment of weight-or volume-based user fee systems and provide assistance to communities who seek to establish such user fee systems.

Source reduction and recycling programs are assumed in these recommendations, with future decisions involving the refinement of these programs, and not whether or not they should be implemented. Other recommendations, not related to specific programs or facilities, but which are essential to maintaining the viability of the state's solid waste management system, are as follows:

- develop a more equitable rate structure which reduces the discrepancy between municipal and commercial tipping fees; and

- The costs of solid waste management should be paid by the actual generators through the implementation of a user-fee system. A user-fee system is the fairest and most equitable method of paying for solid waste management. Successful implementation of a user fee system has the potential to reduce solid waste generation and maximize participation in recycling programs thus, fostering new recycling initiatives, and it provides the most incentive for source reduction.

1-7 GLOSSARY OF TERMS

"Bulky Waste" shall mean large items of solid waste such as appliances, furniture, auto parts, stumps, etc.

"Cell" shall mean compacted solid wastes that are completely enclosed by natural soil or cover material.

"Commercial Waste" shall mean solid waste generated by stores, offices, institutions, restaurants, warehouses, and activities at industrial facilities.

"Composting" means the biological method of stabilizing organic residues through an aerobic self-heating process.

"Composting Facility" shall mean a solid waste management facility used to provide aerobic, thermophilic decomposition of solid organic constituents of solid waste to produce a stable, humus-like material of commercial marketable quality.

"Construction and Demolition Debris Processing Facility" shall mean a recyclables handling and recovery facility which receives and processes construction and demolition debris by any means, for the purpose of recovering recyclables and marketing for value.

"Construction Debris" shall mean waste building material resulting from construction, remodeling and repair operations on houses, commercial buildings, pavements and other structures.

"Cover Material" shall mean clean soil or earth or other material approved by the Director that is used to cover compacted solid waste in a sanitary landfill.

"Demolition Debris" shall mean solid waste generated from the razing of buildings and other man-made structures.

"Drop-Off Center" means a facility provided by the municipality for its residents as a collection point for recyclable materials.

"Geomembrane" shall mean an essentially impermeable membrane used with foundation, soil, rock, earth, or any other geotechnical engineering-related material as an integral part of a man-made structure or system designed to limit the movement of liquid or gas in the system.

"Groundwater" shall mean water found underground which completely fills the open spaces between particles of sediment and within rock formations.

"Hazardous Waste" means any waste as defined in accordance with Section 23-19.1-4 of the General Laws of Rhode Island of 1956, as amended, and regulations adopted pursuant thereto.

"Landfill Gas Recovery Facility" shall mean a facility in which gases produced from the decomposition of solid wastes are collected for the purpose of the control of landfill gas migration and/or for the recovery of energy.

"Leachate" shall mean a liquid that has percolated through, or originated in solid waste and is presumed by these regulations to contain dissolved or suspended materials from solid waste.

"Liner System" shall mean a continuous layer of natural and man-made materials beneath or on the sides of a surface impoundment, landfill, or landfill cell, which restricts the downward or lateral escape of solid waste, any constituents of such wastes, or leachate and which complies with these Regulations.

"Materials Recovery Facility" shall mean a facility that accepts co-mingled recyclables from residents and mechanically separates recyclables for sale to brokers, manufacturers, or other market outlets. A minimum of 90 percent of the material received must be sold to market; no more than 10 percent of the material may be residual solid waste.

"Mixed Recyclables" means those recyclable materials which are required to be removed from municipal solid waste at the source and placed in or on top of the set-out container provided by the State for transport to the nearest MRF for recycling.

"Pollutant" means any dredged material, solid waste, incinerator residue, sewage, garbage, sewage sludge, sediment, munitions, chemical wastes, septage, biological materials, radioactive materials, heat, wrecked or discarded equipment, cellar dirt, industrial, municipal, or agricultural waste or effluent, petroleum or petroleum products including but not limited to oil; or any material which may alter the aesthetic, chemical, physical, biological, thermal or radiological characteristics and/or integrity of water, which may include rock and sand.

"Recycling" shall mean the reuse of recovered resources in manufacturing, agriculture, power production or other processes.

"Recyclable Materials" shall mean those materials separated from municipal solid waste for reuse as listed in the Rhode Island commercial or municipal recycling regulations or the Rhode Island Battery Deposit and Control Regulations, or oil subject to the hard-to-dispose-of tax as stated in Chapter 37-15.1 of the Rhode Island General Law. The materials to be included may change from time to time depending upon new technologies, economic conditions, waste stream characteristics, environmental effects or mutual agreement between the State and municipalities.

"Source Reduction" shall mean the design, manufacture, purchase, or use of materials or products (including packages) to reduce their amount or toxicity before they enter the solid waste stream.

"Source Separation" means the removal by the generator of recyclable materials including mixed recyclables from all other solid waste generated by the household, placement of such recyclable material in and on the set-out container provided by the State, and conveyance of the container to the curbside or other designated location for collection by the municipality of its agents.

"Sanitary Landfill" shall mean a licensed land disposal site employing an engineered method of disposal of solid waste in a manner that absolutely minimizes environmental hazards, including: spreading the solid waste in thin layers, compacting the solid waste to the smallest practical volume; and applying cover material at the end of each operating day, or at such more frequent intervals as may be necessary.

"Segregated Solid Waste" shall mean useful material which has been separated from the waste stream at the point of generation for the purpose of recovering and recycling these materials.

"Septic Waste" shall mean any solid, liquid, or semi-solid waste removed from septic tanks or cesspools, lagoons, trucks, or other sources.

"Sewage Sludge" shall mean a semi-liquid substance consisting of settled sewage solids combined with water and dissolved materials in varying amounts.

"Solid Waste" shall mean garbage, refuse and other discarded solid materials generated by residential, institutional, commercial, industrial and agricultural sources but does not include solids or dissolved material in domestic sewage or sewage sludge, nor does it include hazardous waste as defined in the Rhode Island Hazardous Waste Management Act, Chapter 23-19.1. For purposes of these rules, solid waste shall also include non-hazardous liquid, semi-solid, and containerized gaseous wastes, subject to any special conditions contained in these rules.

"Solid Waste Management Facility" shall mean any plant, structure, equipment, real and personal property, except mobile equipment or incinerators with a capacity of less than one thousand (1,000) pounds per hour, owned or operated for the purpose of processing, treating, or disposing of solid waste.

"Transfer Station" shall mean a solid waste management facility, other than a materials recovery facility or intermediate processing facility, that generates 10 percent or less residual solid waste, and that can have a combination of structures, machinery, or devices where solid waste is taken from collection vehicles and placed in other transportation units for movement to another solid waste management facility.

"Waste Management" shall mean actions taken to effectuate the receipt, storage, transportation, processing for resource recovery, recycling, and/or the ultimate disposal of solid waste.

"White Goods" means major kitchen or laundry appliances, including but not limited to stoves, washers, refrigerators, and dryers. Nothing in this definition shall waive compliance with the Rules and Regulations for Generation, Transportation, Storage and Disposal of Hazardous Waste.

"Wood Waste" shall mean lumber, pallets, crates, plywood, particle board, and saw dust, substantially free of contaminants. Contaminants include: lead paint, banding, bolts over 1¼ inch diameter, shingles, pipe, formica, plastics, and preservatives. Construction or demolition debris that cannot be readily separated is excluded from this definition.

1-8 ADOPTION

This Plan was adopted by:

- a. the Corporation's Board of Commissioners on May 22, 1996 after a public hearing held on May, 22 1996.
- b. the Department of Environmental Management on May 22, 1996 after a public hearing held on May 22, 1996
- c. the State Planning Council, as Element 171 of the State Guide Plan, on November 14, 1996 after a public hearing held on May 22, 1996.

171-2 GOAL, OBJECTIVES AND POLICIES

2-1 INTRODUCTION

A purpose of this Plan is to provide a framework for solid waste management decision-making that includes within its context the state's solid waste policies as set forth in law, regulation, and other plans, and to update state goals, policies and objectives as a framework for managing solid waste in Rhode Island. These goals, objectives and policies provide the basis for the Plan's recommendations and for guiding the actions of other state, local and private programs.

Another purpose of this Plan is to provide guidance to decision makers concerning how to allocate resources to each management option for the achievement of the goal and objectives.

2-2 DEFINITION OF TERMS

Goals, objectives, and policies establish the intent of a Plan. They are supported by legislation and are translated into recommendations for specific implementation measures and are used to guide program direction, administration and implementation activities (e.g., negotiating legislation, development of regulations, preparation of functional plans).

Typically in planning as well as in management, goals, policies and objectives are used in a hierarchy:

- goals are broad, general, statements of direction or desired end states;
- objectives translate goals into specific guidance for actions including, where possible, measurable results and time frames; and
- policies provide guidance as to the approach to be taken in achieving objectives.

For the purposes of this Plan, these terms will be used as defined above, although in law they may be used interchangeably. For example, the declaration of policy in legislation, while intended to provide guidance in implementation, may contain broad, general goal statements, as well as specific targets.

2-3 GOAL, OBJECTIVES AND POLICIES

Development of goals and objectives begins with an examination of the ones in force at the time the Plan was prepared. State policies and objectives for solid waste management are set out principally in state legislation. These are then expanded, clarified, and supplemented in plans and regulations which implement state and federal statutes and requirements.

Accordingly, this chapter is based on major state and federal legislative and regulatory policies, supplemented by goals, objectives, and policies from relevant state plans, and state regulatory policies. The principal sources were the State's solid waste enabling legislation, the Rules and Regulations for Solid Waste Management Facilities issued by DEM, the 1981 Rhode Island Solid Waste Management Plan, the 1987 Rhode Island Statewide Resource Recovery System Development Plan, and the federal Resource Conservation and Recovery Act (RCRA) and related regulations.

2-4 GOAL FOR THE MANAGEMENT OF SOLID WASTE IN RHODE ISLAND

GOAL FOR THE MANAGEMENT OF SOLID WASTE IN RHODE ISLAND

Environmentally sound management of solid waste that protects and preserves the environment and public resources and promotes the convenience, health, comfort, safety and welfare of the people of the state at reasonable cost including, in order of preference, source reduction, source separation and recycling, processing and disposal.

2-5 OBJECTIVES AND POLICIES FOR SOLID WASTE MANAGEMENT IN RHODE ISLAND

The following presents a framework of objectives and associated policies for solid waste management in Rhode Island to provide guidance in planning and management of the various wastes covered in the Plan. In most cases, they reflect and/or complement established legislative goals.

OBJECTIVE 1: Provide for necessary and reliable solid waste management facilities and programs.

Policies include:

- To provide adequate materials recovery facility capacity, either directly or through a private company.
- To implement solid waste management facilities and services by either the state or under state auspices in accordance with this comprehensive plan.
- To develop appropriate governmental structure, processes, and support systems to plan, finance, develop, and operate an integrated Statewide network of solid waste management facilities.
- To limit the creation, licensing, and operation of landfill solid waste disposal facilities to those reasonably required to service the needs of the inhabitants and businesses of this State, having regard for alternative technologies for solid waste disposal.
- To encourage private industry to continue playing a key role in the State's solid waste management programs.

OBJECTIVE 2: Reduce the amount of solid waste generated.

Policies include:

- To encourage industrial processes which generate smaller amounts of wastes.
- To maximize to the extent that is environmentally and economically feasible resource conservation.
- To provide incentives for residents, commerce, business, industry and the public sector to reduce waste.
- To educate consumers regarding ways in which purchases can affect waste reduction.
- To advocate and support the design of systems of waste management to reduce generation by incorporating volume-or weight-based user fee systems where possible.
- To provide technical assistance or referral for source reduction and recycling.
- To plan waste management components in mandated hierarchical priority order.

OBJECTIVE 3: Maximize recovery of post consumer materials that can be reused in the manufacture of new products.

- To expand the amount and types of materials recycled.
- To determine how to most efficiently and cost effectively increase the recycling rate in Rhode Island.

- To facilitate recycling in order to promote the reuse of materials to the same or similar use and to discourage frivolous or non- practical products (i.e. closed loop recycling).
- To increase public education concerning materials recovery and to encourage the purchase of recycled content products, products that are less toxic, and reduced packaging.
- To continue to work with state, national and regional organizations, public and private, and other states to develop new markets for recyclables and for products made with recycled content.
- To develop adequate materials recycling facility capacity so that all cities and towns can participate in the State's recycling program and to accomodate expanded recycling programs.
- To facilitate and encourage state and private procurement of recycled goods.
- To cooperate with other states to create regional systems for recycling and reuse.
- To promote research and development into recycling processes and technologies.

OBJECTIVE 4: Maximize the recovery and reuse of materials from wastes where generation cannot be reduced.

Policies include:

- To facilitate and cooperate with the development of programs and facilities to recover recyclables from the source-separated waste stream.
- To maximize recycling and reuse of such resources.
- To facilitate, cooperate with, support, incentivize and otherwise encourage the development in Rhode Island of waste-based industries which utilize materials recovered from the waste stream as the basic feed stocks or raw materials of their processes.

OBJECTIVE 5: Provide maximum protection of human health and the environment.

Policies include:

- To conduct solid waste management activities in an environmentally sound manner.
- To plan and develop all solid waste management facilities established by the Solid Waste Management Corporation and others in accordance with state laws and regulations, including the regulations of the Department of Health and the Department of Environmental Management.
- To protect the environment and the public health and safety from the effects of the improper, inadequate, or unsound management of solid wastes.

- To recycle or dispose of solid wastes in a manner that minimizes any present or future threats to human health or the environment.
- To minimize landfilling.
- To remove, to the extent feasible, toxins from the waste stream.
- To consider, in facility planning, environmental impacts related to transportation, including fuel consumption, vehicle emissions on air quality and transportation system loading.

OBJECTIVE 6: Achieve and maintain reasonable costs.

Policies include:

- To plan, design, research, and develop innovation in the design, management, and operation of the State's solid waste management system by providing adequate incentives and processes for lowering operating and other costs.
- To provide solid waste management facilities, programs, and services for municipalities, institutions, and persons in the State at reasonable costs in accordance with this plan.
- To use least-cost planning and waste management reliability and effectiveness when designing systems.
- To provide analysis with assumptions regarding the relative costs on a per ton basis for programs and facilities under each of the prioritized modes of management.

OBJECTIVE 7: Provide opportunity for public and inter-agency review in order to maximize the potential of including innovative policies and technologies and to maximize public support.

- To give public notice of all meetings that impact policy and program development.
- To recognize the public right of access to records pertaining to the policy making responsibilities consistent with state law.

171-3 BACKGROUND FOR PLANNING

3-1 INTRODUCTION

The needs and problems of waste management in Rhode Island are a function of the character of the state: its development patterns, natural resources, economy, and social and political features. For example, in this, the second most densely populated state in the United States, it is difficult to find sites for facilities that are not in somebody's backyard. Widespread groundwater and surface water resources and Rhode Island's geological characteristics further restrict siting. On the other hand as the smallest state in land area, with an extensive highway network, Rhode Island has the basis for a relatively efficient, centralized system of facilities.

Population growth or redistribution, industrial growth and types of industry, availability of land and utilities, income and related planning and investment decisions are basic considerations in waste management. These issues are covered in depth in the land use element and other elements of the State Guide Plan. The following is a brief summary of key elements which present a background for waste management planning.

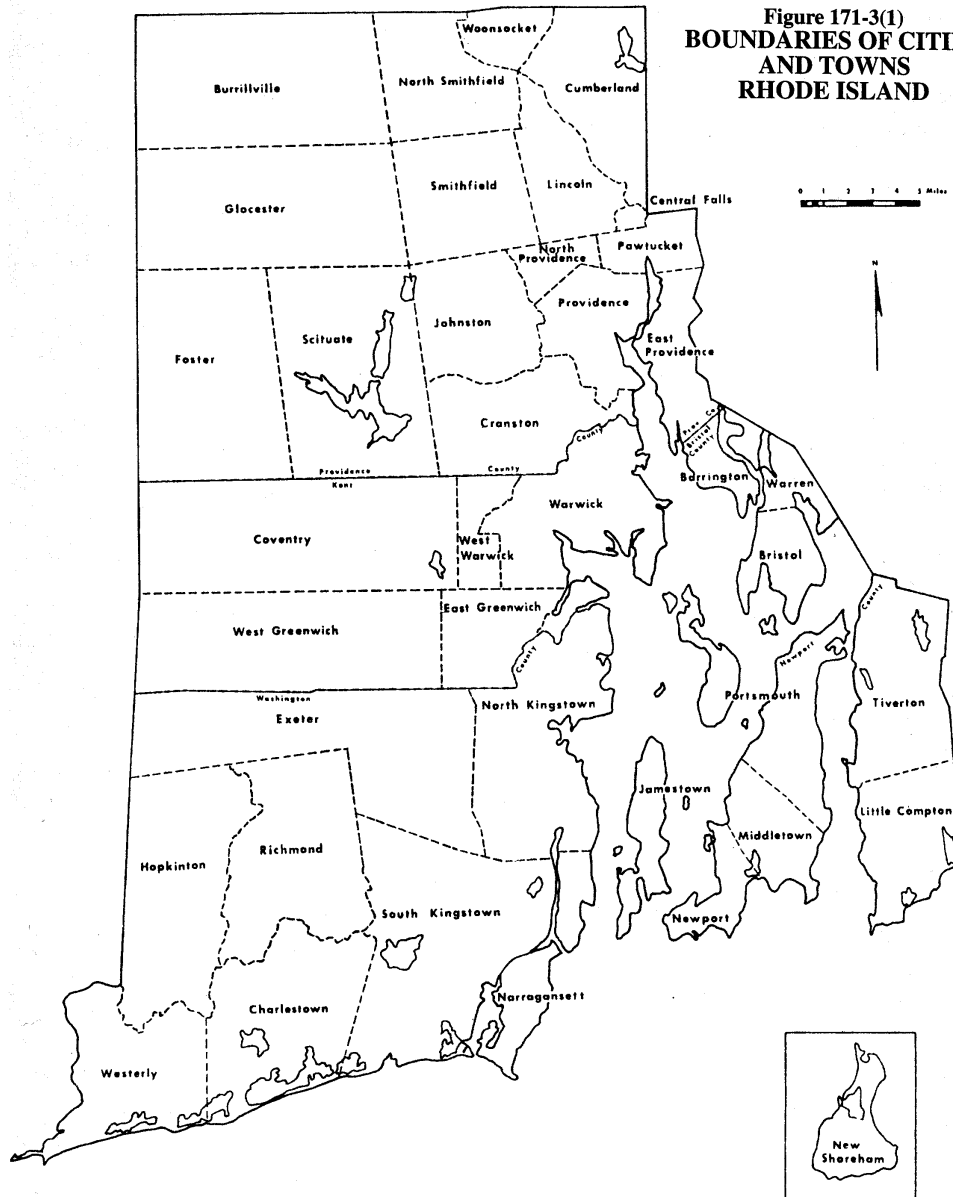
3-2 PROFILE OF THE STATE

Rhode Island is the smallest state, with a net land surface of 658,201 acres (excluding inland waters), comparable to the size of the average U.S. county. The state occupies a niche of approximately 37 by 48 miles on the heavily urbanized Atlantic seaboard, bordered by Connecticut and Massachusetts.

All the land in Rhode Island is contained in 39 incorporated municipalities: eight cities and 31 towns (see Figure 171-3 (1)). The state is also subdivided into five counties (Bristol, Kent, Newport, Providence, and Washington) which serve as judicial districts but have no other governmental powers.

Figure 171-3 (1)

BOUNDARIES OF CITIES AND TOWNS
RHODE ISLAND



3-3 POPULATION

3-3-1 POPULATION DISTRIBUTION

The 1990 population of the state, according to the U. S. Census bureau, is 1,003,464. The distribution of population by city and town for 1980-1990 is shown on Table 171-3 (1).

Table 171-3 (1)

RHODE ISLAND CENSUS FIGURES
1980-1990

City/Town	1980	1990	Difference	% Change
Barrington	16,174	15,849	- 325	- 2.0
Bristol	20,128	21,625	1,497	7.4
Burrillville	13,164	16,230	3,066	23.3
Central Falls	16,995	17,637	642	3.8
Charlestown	4,800	6,478	1,578	35.0
Coventry	27,065	31,083	4,018	14.8
Cranston	71,992	76,060	4,068	5.7
Cumberland	27,069	29,038	1,959	7.3
East Greenwich	10,211	11,865	1,654	16.2
East Providence	50,980	50,380	- 600	- 1.2
Exeter	4,453	5,461	1,008	22.6
Foster	3,370	4,316	946	28.1
Glocester	7,550	9,227	1,677	22.2
Hopkinton	6,406	6,873	467	7.3
Jamestown	4,040	4,999	959	23.7
Johnston	24,907	26,542	1,635	6.6
Lincoln	16,949	18,045	1,096	6.5
Little Compton	3,085	3,339	254	8.2
Middletown	17,216	19,460	2,244	13.0
Narragansett	12,088	14,985	2,897	24.0
New Shoreham	620	836	216	34.8
Newport	29,259	28,227	-1,032	- 3.5
North Kingstown	21,938	23,786	1,848	8.4
North Providence	29,188	32,090	2,902	9.9
North Smithfield	9,972	10,497	525	5.3
Pawtucket	71,204	72,644	1,440	2.0
Portsmouth	14,257	16,857	2,600	18.2
Providence	156,804	160,728	3,924	2.5
Richmond	4,018	5,351	1,333	33.2
Scituate	8,405	9,796	1,391	16.5
Smithfield	16,886	19,163	2,277	13.5
South Kingstown	20,414	24,631	4,217	20.7
Tiverton	13,526	14,312	786	5.8
Warren	10,640	11,385	745	7.0
Warwick	87,123	85,427	-1,696	- 1.9
West Greenwich	2,738	3,492	754	27.5
West Warwick	27,026	29,268	2,242	8.3
Westerly	18,580	21,605	3,025	16.3
Woonsocket	45,914	43,877	-2,037	- 4.4
TOTALS	947,154	1,003,464	56,310	5.9

The population of the state, according to the Division of Planning's 1989 population projections, will grow slowly and at a diminishing rate. The total population increase anticipated over the next two decades from 1990 to 2010 is 5.6 percent (see Table 171-3 (2)).

Table 171-3 (2)

RHODE ISLAND POPULATION 1990-2010

Year	Population	Average Annual Change
1990	1,003,464	
1995	1,022,484	0.37%
2000	1,037,399	0.29%
2005	1,048,819	0.22%
2010	1,059,704	0.21%

3-3-2 Geographic Movement

While the center of population remains in and around the City of Providence, population growth has been strongest in the more rural areas of the state. Since 1980, four of the eight cities lost population. Fastest growth is taking place in the western rural towns and the south coastal communities.

The majority of Rhode Islanders will continue to be city and suburb-dwellers, yet population growth outside the traditional central city and older suburban areas will continue to have a tremendous impact on the lifestyle and resources of previously rural communities. The dispersion of population will heighten siting problems by reducing the land available for new waste management facilities and forcing existing facilities to close as a result of conflicts with new uses. This trend is also likely to increase hauling distances and result in the use of additional roads for waste hauling.

3-4 ECONOMY AND INDUSTRY

3-4-1 Economy

Like most of New England, the Rhode Island economy experienced an economic resurgence in the latter half of the 1980's. The economy was stimulated by a surge in real estate and construction investment, record employment levels, and a constant rise in personal income. The 1990's has brought an abrupt halt to this economic expansion and thrown the region and the state into a recession. Most economists agree that economic recovery will be slow.

3-4-2 Employment

Employment projections prepared by the Division of Planning indicate that employment is projected to continue to increase in each of the next two decades, but slower than it did between 1980-1990, which showed an increase of 11.9 percent. The anticipated increase over the next two decades are 7.7 percent 1990-2000 and 2.0 percent 2000-2010 (see Table 171-3 (3)).

Table 171-3 (3)

ACTUAL AND PROJECTED TOTAL EMPLOYMENT R. I. 1980-2010

Year	Employment	% change
1980	421,000	
1990	471,325	11.9%
2000	507,669	7.7%
2010	518,000	2.0%

Source: Division of Planning, RI Department of Administration, "Rhode Island Employment Projections," unpublished, October, 1991.

3-4-3 Employment Categories

Until 1988, manufacturing was the state's largest single employment sector. For decades, manufacturing employment remained fairly steady (128,305 in 1960, 121,935 in 1970, 132,210 in 1980, and 121,781 in 1985) and was the dominant force driving the state's economy. According to state projections, this stability is predicted to continue, but with only a 1.5 percent growth to 2010.

In 1988, for the first time in decades, service sector employment exceeded manufacturing employment. The service sector is now projected to be the fastest growing sector of the state's economy with a projected growth of over 50 percent. Other employment categories that will produce significant new job opportunities and added employment between 1985-2010 are Finance/Insurance/Real Estate, and Retail/Wholesale Trade, which will grow by 20.0 and 12.0 percent respectively.

3-4-4 Geographic Dispersal

The shift in types of employment has been accompanied by a shift in location of employment. Providence has retained its position as the state's employment center: 30 percent of all jobs were in the capital city in 1985. But this has declined relative to the rest of the state: 42 percent of all jobs were located in Providence in 1960.

3-5 POLITICAL SUBDIVISIONS AND OTHER ADMINISTRATIVE UNITS

Most government services in Rhode Island are provided at either the state or municipal levels. Regional agencies, counties and special districts have very limited, specialized roles of little significance for solid waste management.

3-5-1 Local Government

Rhode Island's 39 municipalities range widely in character from densely populated central cities to rural, largely wooded areas. These municipalities also vary widely in their capacity to plan and deliver services. In waste management planning, a significant distinction can be made between municipalities that have full-time and those with part-time governments.

In addition to the cities and towns, there are 46 special districts in Rhode Island: limited purpose, local governments with independent charters, elected governing bodies, and limited though independent taxing authority. Most were established when Rhode Island was largely a rural state, as a means of providing special services: fire fighting, water supply, street lighting and, in a few cases, solid waste collection, to a portion of a rural town. In recent years these districts have increasingly coordinated their activities, including taxation, with local town governments.

3-5-2 Regional Agencies

There are no sub-state, general purpose, regional governments or regional planning agencies in Rhode Island. The five counties are very limited-purpose administrative units with no significant waste management responsibilities. For many purposes (e.g. transportation, water quality planning, intergovernmental review, etc.) the state serves as a regional agency. In the past, groups of municipal governments established "councils of governments" (e.g. the Blackstone Council of Governments, the Coalition of Coastal Communities which are dormant). All had limited functions, no taxing authority, and very small staffs. There are several single-purpose regional public service districts, including the Narragansett Bay Water Quality Management District Commission (NBC), the Providence Water Supply Board, and the Bristol County Water Authority.

3-6 TRANSPORTATION

In Rhode Island, virtually all waste is trucked over the state's roadway system. As Figure 171-3 (2) indicates, most of the state is readily accessible to one or more major highways, including an extensive network of limited access highways that link major urban areas.

In addition to the roadway system, the Providence and Worcester Railroad provides rail freight service along the state's remaining rail lines. Waterborne freight cargo facilities are available in Providence, East Providence Tiverton, and Quonset Industrial Park although there is little intrastate waterborne shipping except for that provided along with passenger ferry service to Prudence and Block Islands.

Figure 171-3 (2)

RHODE ISLAND MAJOR HIGHWAY SYSTEM

